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ABSTRACT

Personalized System of Instruction (PSI) is an instructional plan which uses units of material and divides classes of students into small groups, each with a "manager" in charge. The manager is one who has taken the course previously; he acts as a chief proctor who gives oral examinations to the first four students who are ready to pass a unit and who then become student proctors for the rest of the course for that unit. All other students pass that unit by taking an oral examination from those four students, and advance through the course by becoming proctors of other units. The manager also gives written examinations for each unit. In this way, the material in the course is explained at a level of the professor who has been familiar with the material for a long period of time. When the PSI was used in a beginning psychology course at Utah State University, the amount and depth of learning achieved was apparently much greater than is usually the case with other methods of instruction. (SH)

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PSI AS VIEWED BY AN ENGINEERING STUDENT

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Paper Presented at the Annual Meeting of the
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Personalized Instruction as Viewed by an Engineering Student

Peter Goodall

Abstract

In the two years I have worked as a proctor with the personalized instruction of beginning psychology, I have realized many advantages this system has over other teaching systems. Mastery of the material is demonstrated orally to another student (proctor) who knows the material at the same level or at a level than that of the interviewee. In this way the material is explained at a level which is easy for the student to understand rather than at the level of the professor who has been familiar with the material for a long time. Our class was divided into small groups, each with a "manager" in charge. The course was programmed into 30 units of study material in sets of 3 units each. After each set was passed orally to proctors, the student took a written exam. Continuation was contingent upon passing the written exam at 90% mastery. Each unit was worth a certain number of points if passed orally on a scheduled day, but extra points were available for passing early and points were lost if taken late. The first four students to pass an oral interview from me (the manager) were made proctors for that unit for the reaminder of the quarter. Other students wishing to take that unit took it from the proctor. The four proctors could not advance until they had passed four more students who would then be able to be made proctors by passing the next unit from me. Some effects of these procedures were to create a "rush" to complete the course in time. In my experience as a proctor, I feel that I have come to understand more about psychology and basic behavioral patterns than I could have in any other way.

Since my stay at Utah State University, I have had several experiences with programmed learning in such fields as Physics, Mathematics, Engineering, and Psychology. These usually involved receiving a set of "objectives" for each learning Unit. In these classes, as soon as the student mastered the material, he took a written test. He could retake it if he failed until a certain time period had passed or until he demonstrated mastery of the material at 90% or better. This method was vastly superior to the traditional method involving lectures, note taking, and passing of exams. Contrary to the traditional system where the amount of learning is dependent on the amount of time in which the course is taught, the programmed method makes the amount of learning specific and constant for all students with the amount of time spent learning the required material being the dependent variable. With these programmed courses, however, I found little or no retention after I have finished each section. There were generally no contingencies requiring subsequent review of the material. I was disappointed with programmed learning until I came into contact with the Personalized System of Instruction (PSI).

The reason that I am interested in PSI is because of a couple of very good experiences with it. My first contact with PSI was in an engineering class called Introductory Fluid Mechanics, taught by Dr. Gordon Flammer (see also Flammer, 1971). In this class, the material was divided into 16 units. Each unit covered a basic concept or set of concepts. At the beginning of the quarter, each student specified the final grade he wanted and class contingencies for each student depended on the final grade he desired. On each exam (one for each unit plus a comprehensive final), no concept errors and one arithmetic error were allowed for a "B" grade; one concept error and two arithmetic errors were allowed for a "C" grade. A student could repeat an exam any number of times until he passed according to his predetermined contingency.

The only way an "A" grade could be earned was by 15 hours of tutoring, 5 of which could be earned by being tutored by someone else and the rest by tutoring someone else less advanced than himself. I was very excited about this class. I did very well and I am still enthusiastic about that subject.

My next contact with PSI was in Introductory Psychology with Mr. Edwards (see Edwards and Powers, 1971; Powers and Edwards, 1971). In this class, mastery of the material was demonstrated orally to a proctor (another student who knew the material at the same level or a level slightly higher than that of the examinee). This way the material was explained at a level which was easy for the student to understand rather than at the level of the professor who has been familiar with the material for a long period of time. I have worked with this class for two years now. In my experience as a proctor I feel that I have come to understand much more about psychology and basic behavioral patterns than I could have any other way.

The class was divided into several small groups, each with a "manager" in charge (see also Ensign, Edwards, and Powers, 1971). The manager was a student who had taken the course previously and now acted as the chief proctor in this group. During the fall quarter 1971, I was a manager and I was responsible for 24 students in the Introductory Psychology class. The course was separated into 30 units of study material insets of 3 units. After each set had been passed orally to student proctors or the manager, the student would take a written exam to verify his mastery. This written exam was a fail-safe to make sure that the proctors were doing a good job. Continuation to the next set was contingent on passing the written exam. Each unit was worth 10 points if passed on the day scheduled, but extra points could be earned by passing it early and points were lost by passing the unit late. Once they got started, some students were earning up to 24 points per unit.

My group met at a different place and time than most of the other students. I found it much easier to relate with the students on a personal level than in a large, noisy classroom. The first four students to pass a unit from me (the manager) automatically became proctors for the unit for the rest of the quarter and any other student wishing to pass that unit would take it from them. These four students could not advance until they had passed four more students who would subsequently come to me to pass the following unit and become proctors for the unit. This way I was able to meet and know on a personal level all the students in my group; and, also a maximum number of students were able to take advantage of the additonal learning experience involved in explaining the material to someone else.

One very serious drawback of the course as it was taught last fall quarter was the fact that most of the students completed one third of the course between week 5 and week 7. This was due to a contingency stating that if a student were to complete the course by the end of the seventh week, he would be exampt from the final. This has been subsequently changed requiring all students to take the final exam with the test offered on Friday each week during the last 5 weeks of the 10 week course. This has created a much more constant rate of performance.

The graph of the average rate of performance against elapsed time appears to be logarithmic in nature which suggests that the longer amount of time covered by a course of this type, the greater will be the amount of learning achieved per unit time (see Figure 1).

Insert Figure 1 about here

When I started out as a manager, I assumed that the 14 student-proctors would be somewhat held back and that a graph of their progress would show deep scallops and plateau after each interview. Although a certain amount of scalloping is evidenced in Figure 2, it is less than that of the average student shown in Figure 1. It is interesting to note that, rather than being logarithmic in shape as is that of the average student, the proctors' progress versus time graph is almost a straight line function.

Insert Figure 2 about here

The graphs of two remarkable exceptions to the average are shown in Figure 3. One (CE) was unaffected by the final exam exemption for finishing the course early until the last week. During that week, she completed the course material which was adequate to achieve a "B" grade. The other (TW) was totally unaffected by the contingency of exemption from a final exam and achieved an "F" grade although she continued to complete course material. Five other sutdents showed similar progress but withdrew from the class before the end of the quarter. All 5 students retook the class the following quarter when all students were required to take the final and received "A" grades.

Insert Figure 3 about here

The contingency for exemption from a final exam has been proven to be undesirable but one more detrimental effect needs to be noted. As their manager, and because of my person interaction with each student, I wanted to see each one

obtain an "A" grade and be exempt from the final so I "pushed" the students into finishing by the end of the seventh week. This occurred even to the extent of proctoring many interviews myself, and in several cases perhaps I was too lenient causing the final part of the progress to be surprisingly steep.

As I see it, the main problems of the PSI method are taken care of by the instructor in the tremendous amount of organization required at the beginning of the course, constant maintenance of individualized records on each student, and monitoring the interviewing methods of each proctor.

Other than these minor problems, I see only advantages since learning is an enjoyable experience with PSI. The amount and depth of learning achieved is much greater than with any other method I have encountered. I regret that many more college courses are not taught using this method.

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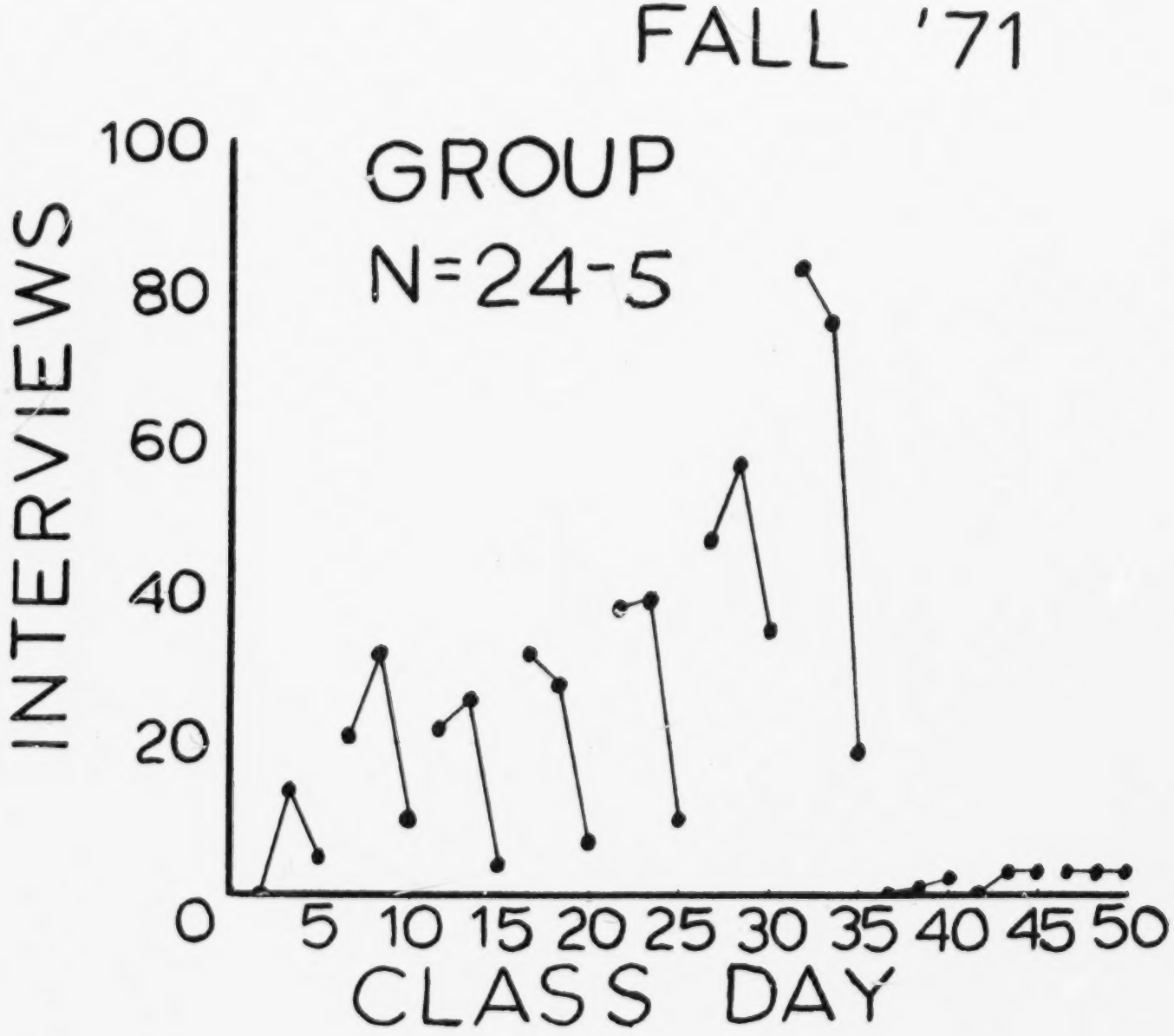
[1]The assistance of K. A. Edwards in the preparation of this paper is gratefully acknowledged.

Figure Captions

1. Records of total oral interviews taken during the quarter. Each section of three data points represents Monday, Tuesday, Wednesday, Thursday, Friday, and weekends. The N was 25 at the beginning of the term. At the end of the term, the N was 19.
2. Records of proctor oral interviews taken during the quarter. The total number of proctors during the term was 14. See Figure 1 for a discussion of the data points.
3. Representative commulative records of oral interviews taken by a "B" student and an "F" student during the fall term. See Figure 1 for a discussion of the data points.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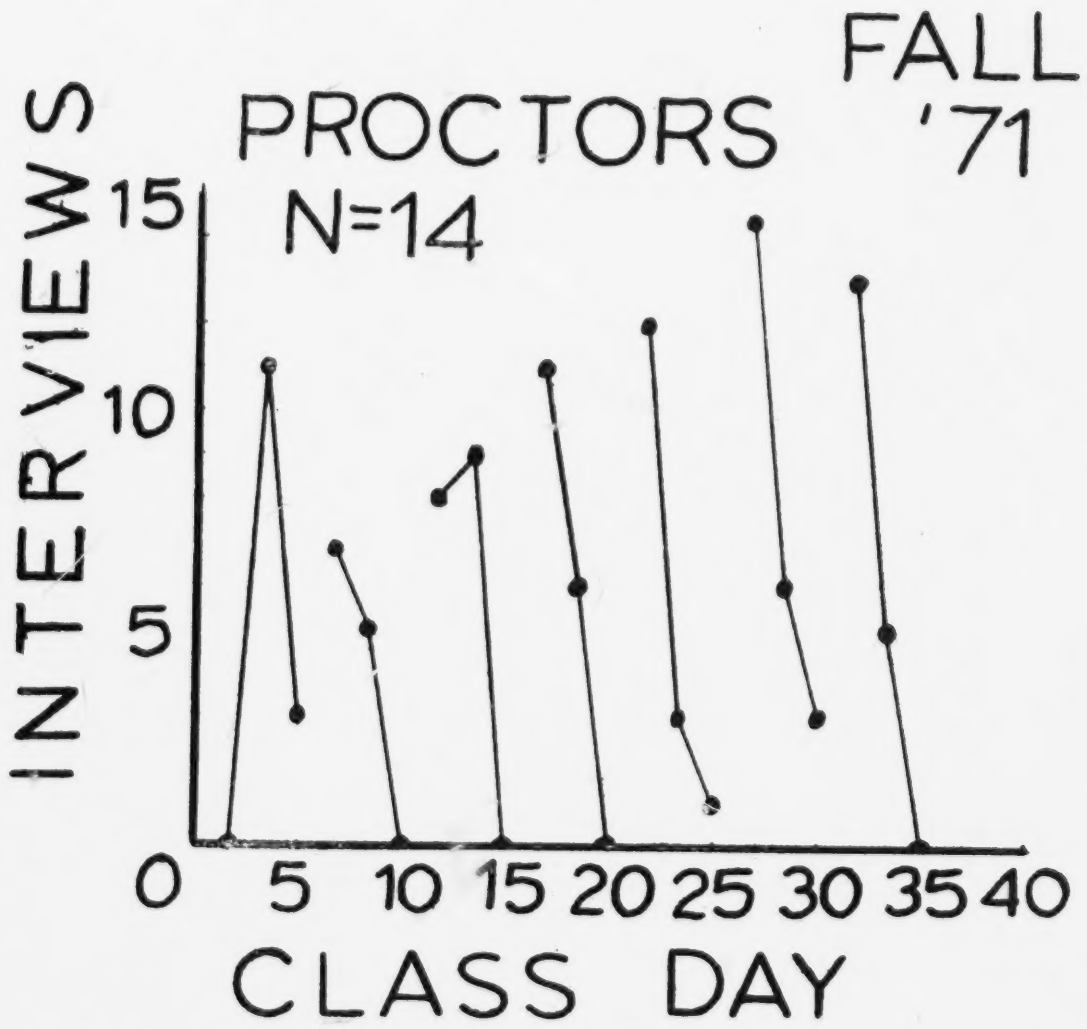
CLASS DAY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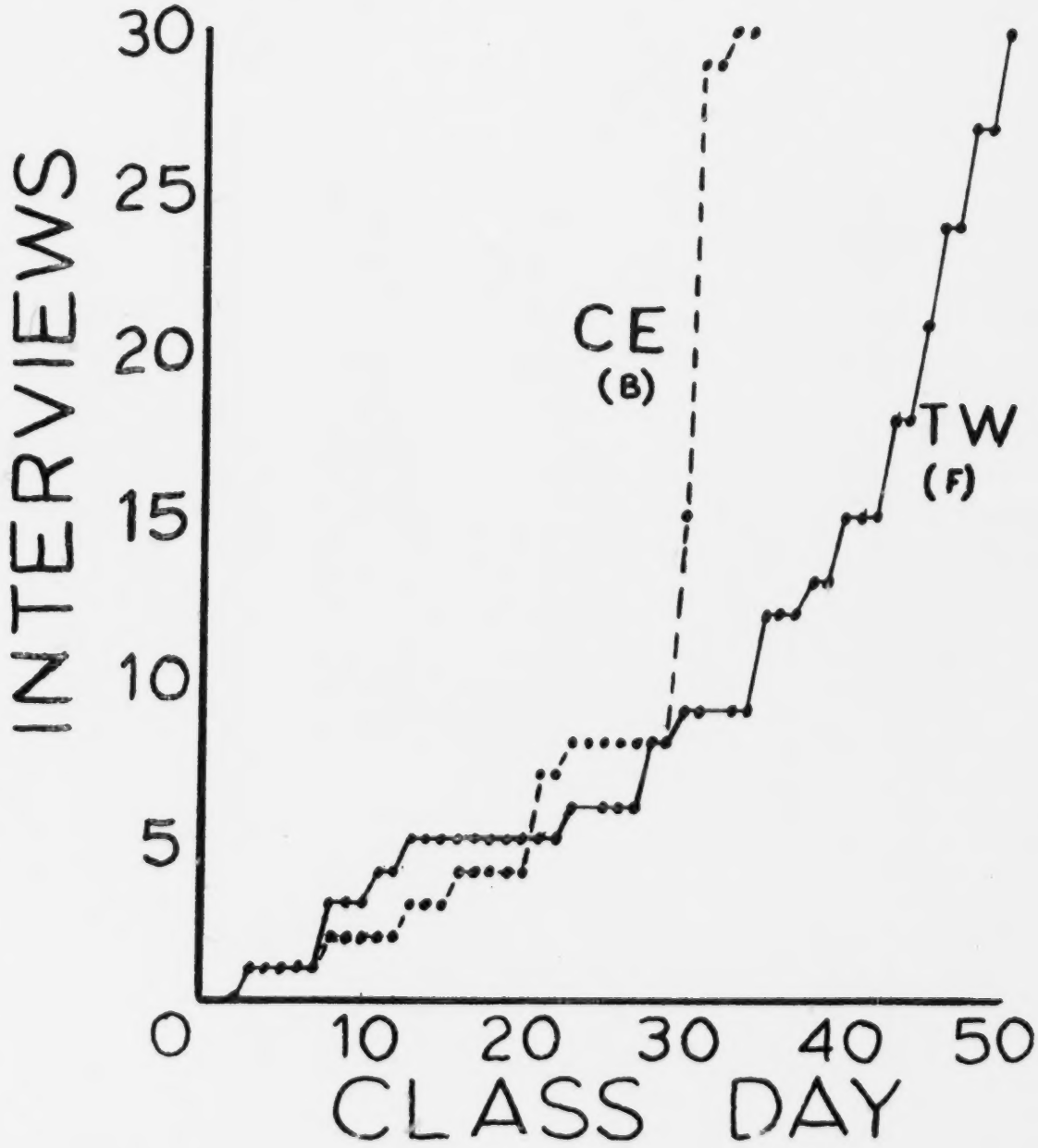
CLASS DAY


INTERVIEWS
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CLASS DAY
CE
(B)
TW
(F)